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Military Recruitment and the War on Terrorism

by

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Military Recruitment and the War on Terrorism

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Abstract

Military Recruitment and the War on Terrorism

Maggie Catherine Austin, M.A.

The University of Texas at Austin, 2006

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The War on Terrorism has changed the context of military recruiting. Initially, an outpouring of patriotism following the September 11th attacks boosted military recruiting. But as the wars in Iraq and Afghanistan continue, it is becoming more difficult for the military to attract high quality recruits, most notably in the Army. While the percentages of high quality recruits recruited by each service branch have increased across the entire sample period in all the services except the Army, the trends in all the services are showing greater signs of decline indicating the mounting effects of the War on Terrorism are starting to have significant effects. This downward trend is especially evident using an alternative measure of high quality which more strictly differentiates between quality levels of recruits.

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I. Introduction

Since the September 11th terrorist attacks the United States has been increasingly involved in combat operations under the context of the War on Terrorism. These operations are the first large scale combat operations since the end of the Vietnam War and the establishment of an all-volunteer force. In the first significant test of the viability of an all-volunteer force military recruiting numbers are beginning to show signs that sustained combat and rising casualties are straining the Department of Defense's ability to meet its recruiting goals, most notably in the Army. This raises the question of how the War on Terrorism has affected military recruitment overall.

All four military services have long used various incentives to attract high quality recruits into their ranks, in forms ranging from cash bonuses for enlistment to money for college. Many of these programs were expanded in the 1990's when a booming civilian economy and post-Cold War security drawdown hurt the ability of recruiters to attract a new generation of young people more interested in going to college than serving in uniform (Warner, Payne, Simon, 2001). After the September 11th terrorist attacks the military was buoyed by rising patriotism and support for stronger national defense. However, as the wars in Afghanistan and Iraq continue to drag on and casualties mount, the military is again facing difficulties in attracting high quality recruits.

This paper analyzes empirically the competing effects of the War on Terrorism and enlistment incentives on high quality recruits for all four services. Unlike a majority of other studies on the subject of military recruiting it does not use demographic data such as age, race, sex, or state of residence to differentiate between recruits. The focus in

this paper is on changes in aggregate accessions and the average quality of new recruits across all four services, and not on how individual characteristics affect the probability of enlisting in the military or subsequent performance. Additionally, this paper constructs alternate measures for determining high quality that go beyond the traditional measure used by the military, which is rather broad. By further differentiating among recruits any effects on quality will be seen more clearly and provide a more accurate picture of how the quality of today's troops has been affected by the War on Terrorism. Empirical Results indicate that while the percentage of high quality recruits has risen overall across the entire sample period in all services except the Army. However, in the most recent months the trend has been a decline in the percentage of high quality recruits across all of the services, which continues to be the strongest in the Army. This trend is even more evident when looking at the percentage of high quality recruits using a stricter definition for high quality.

II. Background

An Overview of Enlistment Incentives

The military faces a unique challenge in attracting high quality individuals to serve. In contrast to civilian employers, the military compensation system is relatively inflexible and pay raises for new recruits are infeasible without incurring significant costs from granting similar pay raises to all service members. Therefore, the military compensation system is often challenged by difficult and sometimes conflicting objectives (Simon and Warner, 2003). To overcome these challenges other types of bonuses are used to attract new and better recruits.

The two primary measurement of enlistment incentives used in this paper are enlistment bonuses in the form of one time cash bonuses offered at the time of enlistment, and education bonuses in the form of the Montgomery G.I. Bill (MGIB). The MGIB, which is the basic education incentive used by all four services, provides up to 36 months of benefits to eligible veterans for college, or other job training such as vocational courses or flight training.[1] Signing up for the MGIB requires a reduction of pay by $100 a month for the first year on active duty.[2] To receive MGIB benefits an individual also must have a high school diploma (or equivalent) and must be honorably discharged from the military after at least fulfilling his/her initial contract, which typically lasts three years. Benefits are then based on several factors such as duration of service and length of training. The basic monthly rates increase each fiscal year, with a significant increase over the sample period.[3] The basic monthly rate as of October 2005 was $1,034, for 36 months, for full time recipients enrolled in institutional training.[4] Several options exist on top of basic MGIB benefits to expand benefits. These include a maximum $600 buy-up in which members on active duty will receive an extra $5 a month in benefits for each $20 a month they contribute, with a maximum contribution of $600. College Fund "kickers," or lump sum additions, are also available, but must be awarded at time of enlistment by individual branch of service (Army and Navy only), and are often based on

[1] More detailed information is available on the U.S. Department of Veterans Affairs website, http://www.gibill.va.gov/pamphlets/CH30/CH30_Pamphlet_General.htm.
[2] Based on Category I eligibility.
[3] Full-time monthly rates for institutional training increased from $650 (Nov 2000) to $672 (Oct 2001) to $800 (Jan 2002) to $900 (Oct 2002) to $985 (Oct 2003) to $1004 (Oct 2004) to the current rate of $1034 (Oct 2005) according to the Department of Veterans Affairs, http://www.gibill.va.gov/GI_Bill_Info/rates.htm.
[4] http://www.gibill.va.gov/GI_Bill_Info/rates/CH30/ch30rates100105.htm.

entry into specific career fields or "critical occupational specialties." College Fund benefits are only allowed as an addition to MGIB benefits, and cannot be used separately. Other bonuses offered vary by service. The Army, for example, offers bonuses to recruits who sign up for early report dates (high school seniors), possess "civilian skills" in demand by the Army, or Middle Eastern language translator bonuses.[5]

Data

Data for all four services was provided by the Defense Manpower Data Center (DMDC) which collects, archives, and maintains manpower and personnel data for the Department of Defense. I received data on every active duty recruit between fiscal year 1999 and fiscal year 2005, or October 1999 through September 2005 (1,107,537 individuals). This does not include National Guard or Reserve forces, nor does it include individuals with prior military service or re-enlistments. Information on each new recruit includes accession date by month, branch of service, education level code, Montgomery G.I Bill enrollment and action codes (if the recruit chose to enroll in the program or not), and enlistment bonuses. However, data on MGIB benefits is limited to basic benefit entitlement and does not include information on any of these added incentives. Furthermore, only the raw dollar value of enlistment bonuses is available and extra incentives unique to each service are not included. Data on combat-related casualties was obtained through press releases on the Department of Defense website, as was information on objective and actual recruiting levels for each fiscal year.

[5] http://www.goarmy.com/benefits/money_bonuses.jsp#Enlistment.

An initial look at recruiting objectives versus actual recruits reveals that each of the services except the Army met or exceeded their objectives in each fiscal year during the sample period (See Figure 1). The Army met or exceeded its objectives in each fiscal year prior to 2005, when it fell short, only meeting 92% of its objective for new recruits. These numbers present a fairly positive picture of military recruiting despite the shift towards combat during this time period. However, these numbers do not reflect quality levels of recruits or the incentives they received to enlist. If factors such as increased combat operations and casualties resulting from the War on Terrorism are important for military recruiting it would be expected that the military's ability to recruit would decrease over the sample period. If this is not the case it is likely that either the services began accepting lower quality recruits to fill the ranks, increased incentives to continue to attract the same quality of recruits, increased the aggressiveness in recruiting by recruiting more individuals overall, even if a declining portion of individuals who were targeted actually chose to enlist, or simply changed the amount of recruits it accepts. Figure 2 shows the number of recruits per month across the entire sample period for each service. While somewhat cyclical trends are evident it does not appear as though the military has decreased the number of recruits it accepts in any significant way, nor has it increased recruits significantly which would otherwise possibly explain decreased percentages of high quality in an inflated force.

Enlistment incentives that are comparable across services are basic MGIB benefits and enlistment bonuses. Figure 3 shows the percentage of new recruits receiving an enlistment bonus at the time of enlistment for each service. These percentages have

significantly declined across all the services since FY 1999 to the point of almost being irrelevant. Additionally, total expenditures on bonuses have declined (See Figure 4). One potential reason for this decline is that given the large demands on the military's budget imposed by sustained combat operations there is simply less money for luring new recruits to serve. While the use of bonuses as an incentive tool may have risen overall, it is important to note that manpower planning decisions also focus on achieving reenlistment targets, especially in fields that require significant and expensive training, and not just on attracting new recruits (Simon and Warner, 2003). It may be that more money has simply been shifted towards targeting service members to reenlist as opposed to targeting new recruits, with the hope of achieving the added benefit of reducing training and accession costs. Another potential explanation would be that incentives have been shifting away from purely monetary bonuses towards greater reliance on educational benefits or other incentives to attract new recruits. However, the percentage of new recruits qualifying for Montgomery G.I Bill educational benefits upon initial entry has been fairly constant over time (See Figure 4).[6] While the MGIB does not account for all educational benefits available to recruits, the data indicate that decreased enlistment bonuses have not been compensated by more recruits choosing to take advantage of educational incentives in the form of GI Bill benefits. It is possible that college fund "kickers" and loan repayment programs, which have supplemented traditional MGIB benefits in recent years, have helped account for some of the difference.

[6] MGIB benefits are available to almost all recruits, with few exceptions; however, not all recruits choose to participate.

Therefore, based on the available data, it does not seem that incentives were significantly increased as a way to continue attracting high quality recruits. In fact the data seems to support the opposite. However, given the limitations of the data it is likely that instead of declining, incentives have instead been shifted towards attracting active duty service members to reenlist, or have become more tied to specific skill sets or career fields which make comparisons across services more difficult. Therefore, this paper will focus primarily on how the War on Terrorism has affected high quality recruits across the services and then draw some conclusions about the effects on military recruitment overall.

The minimum standard that is most traditionally used in measuring recruit quality is based on education level and performance on the Armed Forces Qualifying Test (AFQT). For a recruit to be considered "high quality" he/she must have a high school diploma (or equivalent) and score in category 3A or above on the AFQT, which corresponds to being in the top half of the distribution (Asch et al., 2005). The military breaks down AFQT scores into five categories based on percentiles (see Table 1). This measure of quality is supported by previous studies that have shown a positive link between AFQT scores and performance on combat-related tasks (Orvis et al. 1992), and that "individuals with these scores and educational status are considered the most desirable recruits, for their ability to succeed in and complete training" (Kilburn et al. 1998). Similarly, studies have shown that recruits with a high school diploma are more likely to fulfill their service commitments (Buddin 1998, Warner and Solon 1991).

Table 2 shows a matrix of the percentage of recruits in each combination of AFQT category and education level in each service. The shaded areas at the top right of each service's matrix represent recruits that are considered high quality according to the conventional definition. The Air Force has a significantly higher percentage of high quality recruits than the other services, although the lowest percentage was perhaps surprisingly in the Navy. Figure 6 shows the percentage of new recruits in each service in each AFQT category over the sample period, while Figure 7 shows the number of recruits in each service scoring in the lowest percentiles on the AFQT. Focusing on this information reveals that the largest number of those at the low end of the distribution of AFQT scores are Army recruits even though the Army has a higher percentage of high quality recruits than both the Navy and the Marine Corps. This indicates that the Army most likely accepts more low end recruits that the other services even if this number appears smaller when seen as a percentage of overall recruits. Furthermore, it supports the idea that of the recruits that are not considered high quality many of those at the lowest end of the spectrum are Army recruits.

The most revealing information in terms of measuring the trend in recruit quality is to look at percentage of recruits that are high quality by branch of service and by month (See Figure 8). The data suggest that the ability of the military to attract high quality recruits is beginning to decline among all services, even though the percentage of high quality recruits has risen overall across the entire sample period in the Navy, Air Force, and Marine Corps. This negative trend is strongest in the Army which now has the lowest percentage of high quality recruits, and has consistently since at least October

2004. One possible explanation for this is the increase of casualties related to the War on Terrorism, with the Army having the highest casualty rates, especially compared to the Air Force and the Navy which have had relatively few (See Figure 9). The possible exception to this is in the Marine Corps. The Marine Corps has suffered large casualties, especially in relation to its overall size, yet seems to be less affected than the Army in its ability to attract high quality recruits, and its percentage of high quality recruits has been the most stable among the services. Cultural factors can reasonably explain why the quality of Marine Corps recruits has been less affected by higher levels of combat casualties. A priori one might expect that a typical Marine Corps recruit would be more inclined to join the military for the warrior ethos, etc rather than the opportunity to receive education benefits or other incentives. However, these types of benefits are often seen as one reason why many young people, perhaps with little other opportunities for civilian employment, join the other services. The pool of recruits targeted by the other services, therefore, is most likely broader than that targeted (or at least actually recruited) by the Marine Corps.

III. Empirical Analysis

In order to try to separate the effects of these diverse variables I estimate a simple fixed effects model for new recruit quality. The dependent variable, HQ_{it} , is the percentage of recruits who are high quality (based on the traditional definition of high quality used by the military) in service branch i and month t. Using monthly data from all four services from October 1999 through September 2005 I have a total of 288

observations. In the most basic model, I use dummy variables for service (with the base category being the Air Force), and a linear time trend as explanatory variables, as follows:

$HQ_{it} = \beta_1 + \beta_2 ARMY + \beta_3 NAVY + \beta_4 USMC + \beta_5 TIME + \varepsilon_{it,}$ where

HQ_{it} = % high quality recruits in month t for service i

ARMY, NAVY, USMC = service dummies

TIME= general time trend

Using STATA Version 8.2 to run this regression I obtained the following results:

Table 3: Coefficients of Service Dummys and Linear Time Trend

Dependent variable is indicator for High Quality	**Coef.**	**Std. Err.**	**t**
Army**	-.0992203	.0062472	-15.88
Navy**	-.1193534	.0062472	-19.11
Marines**	-.0923178	.0062472	-14.78
Linear time trend**	.001243	.0001063	11.70
cons	.7059316	.0058789	120.08

(* indicates significance at the 5 percent level, ** indicates significance at the 1 percent level)

Number of Observations: 288
Prob > F = 0.0000
R-Squared: .6681

The results from the basic model clearly show a strong significant service effect with all three service coefficients negative and significant at the one percent level. This indicates that the Army, Navy, and Marine Corps are less able to recruit high quality individuals than the Air Force, with the Navy having the largest negative coefficient. The general linear time trend is also significant at the one percent level, and shows a small

positive trend in the quality of recruits over time. However, using a single time variable forces all of the services to follow the same trend and does not allow for the services to vary differently across time. Therefore, allowing for variations in time trends between the services by adding additional variables to interact the linear time trend with each service produces the following results:

Table 4: Coefficients of Service Dummys, Linear Time Trend, and Interaction between Time and Service Dummy Variables

Dependent variable is indicator for High Quality	**Coef.**	**Std. Err.**	**t**
Army*	-.0263755	.0111535	-2.36
Navy**	-.1250054	.0111535	-11.21
Marines**	-.0618782	.0111535	-5.55
Linear time trend**	.0019118	.0001878	10.18
Time*Army**	-.0019957	.0002655	-7.52
Time*Navy	.0001549	.0002655	0.58
Time*Marines**	-.000834	.0002655	-3.14
cons	.6815235	.0078867	86.41

(* indicates significance at the 5 percent level, ** indicates significance at the 1 percent level)

Number of Observations: 288
Prob > F = 0.0000
R-Squared: .7438

These results indicate that time trends do differ across the services. Compared to using a single time trend, separating the services shows the Army coefficient to be slightly less negative and only significant at the five percent level. Conversely, the coefficient on Navy increases slightly while the coefficient on the Marine Corps decreases slightly relative to the Air Force. Additionally, the Army and Marine Corps both show (significant) negative linear time trends across the sample period compared to the Air

Force, with the Army having the largest negative time trend. The trend for Navy appears to be positive, but is not statistically different than zero.

Given the events leading up to the War on Terrorism, and the escalation of the conflict, other powerful and significant events such as the September 11th terrorist attacks and the invasion of Iraq are likely to influence military recruiting. Therefore, I added dummy variables for pre/post September 11th [7] as well as pre/post the invasion of Iraq[8] to evaluate the effects of these events on the ability of recruiters to attract high quality individuals. This produces the following results:

Table 5: Coefficients of Service Dummys, Linear Time Trend, Interaction between Time and Service Dummy Variables, and Significant Event Time Trends

Dependent variable is indicator for High Quality	**Coef.**	**Std. Err.**	**t**
Army*	-.0263755	.0105917	-2.49
Navy**	-.1250054	.0105917	-11.80
Marines**	-.0618782	.0105917	-5.84
Linear time trend*	.0006661	.0002958	2.25
Time*Army**	-.0019957	.0002522	-7.91
Time*Navy	.0001549	.0002522	0.61
Time* Marines**	-.000834	.0002522	-3.31
Time trend pre/post September 11th terrorist attacks**	.0395367	.007219	5.48
Time trend pre/post invasion of Iraq**	.0253418	.0076583	3.31
cons	.6900744	.0078942	87.42

(* indicates significance at the 5 percent level, ** indicates significance at the 1 percent level)

Number of Observations: 288
Prob > F = 0.0000
R-Squared: .7706

[7] The month of September 2001 was included in the pre period.
[8] The invasion of Iraq officially took place on 19 March 2003. The month of March 2003 was included in the pre period.

The results show that both September 11th and the invasion of Iraq have positive effects and are significant at the one percent level. This likely reflects the "rally around the flag" effect that generally occurs following either a catastrophic event or the beginning of a war. September 11th especially was followed by an outpouring of patriotism that resulted in a substantial number of new recruits, many of them high quality. Similarly, at the beginning of the war in Iraq, which was then seen primarily as a continuation of the response to the September 11th attacks, the military was very popular and patriotism and a desire to fight back boosted military recruiting efforts.

However, as the fighting continues these effects have begun to wear off, and as casualties increase military recruiters face an increasingly difficult task. Given the rising casualty numbers in the War on Terrorism it is relevant to test how casualties affect high quality recruits specifically. Since casualties are disproportional across the services, one way to measure this effect is to include a variable based on the number of casualties in a specific branch for the previous month. This assumes that an Army recruit will be most responsive to Army casualties, a Navy recruit to Navy casualties, and so on. The previous month's numbers are used because it likely takes some time for the latest casualty figures to begin to affect recruiting. Including this variable in the model produces the following results:

Table 6: Coefficients of Service Dummys, Linear Time Trend, Interaction between Time and Service Dummy Variables, Significant Event Time Trends, and Individual Service Casualties

Dependent variable is indicator for High Quality	**Coef.**	**Std. Err.**	**t**
Army*	-.0330878	.0110497	-2.99
Navy**	-.124969	.0105341	-11.86
Marines**	-.0650618	.0106522	-6.11
Linear time trend*	.0006113	.0002955	2.07
Time*Army**	-.0015944	.0003204	-4.98
Time*Navy	.0001583	.0002508	0.63
Time* Marines**	-.0006619	.000265	-2.50
Time trend pre/post September 11th terrorist attacks**	.0378795	.0072268	5.24
Time trend pre/post invasion of Iraq**	.0299079	.0079476	3.76
Casualties for individual service branch(lagged 1 month)*	-.0004174	.0002075	-2.01
cons	.6914947	.0078829	87.72

(* indicates significance at the 5 percent level, ** indicates significance at the 1 percent level)

Number of Observations: 288
Prob > F = 0.0000
R-Squared: .7739

The results indicate that casualties measured in this way do have a slightly negative affect on the percentage of high quality recruits, significant at the five percent level. Furthermore, including this variable results in a larger negative coefficient for the Army service effect, which is significant at the five percent level.

However, it is also possible that recruits are influenced by the total number of casualties, and that they do not necessarily differentiate between casualties from other services and their own. Using this measure for casualties instead yields the following results:

Table 7: Coefficients of Service Dummys, Linear Time Trend, Interaction between Time and Service Dummy Variables, Significant Event Time Trends, and Total Casualties

Dependent variable is indicator for High Quality	**Coef.**	**Std. Err.**	**t**
Army*	-.0263755	.0106082	-2.49
Navy**	-.1250054	.0106082	-11.78
Marines**	-.0618782	.0106082	-5.83
Linear time trend*	.0006997	.0003099	2.26
Time*Army**	-.0019957	.0002526	-7.90
Time*Navy	.0001549	.0002526	0.61
Time* Marines**	-.000834	.0002526	-3.30
Time trend pre/post September 11th terrorist attacks**	.0389137	.0074234	5.24
Time trend pre/post invasion of Iraq**	.0270583	.0089622	3.02
Total Casualties for all service branches (lagged 1 month)	-.0000392	.0001059	-0.37
cons	.6896817	.0079773	86.46

(* indicates significance at the 5 percent level, ** indicates significance at the 1 percent level)
Number of Observations: 288
Prob > F = 0.0000
R-Squared: .8144

In this model casualties are not significant at either the one percent or five percent level. This indicates that recruits do in fact differentiate between casualties in different services. In fact, recruits may be influenced by casualty levels not only in their own service but in the other branches as well, especially if some sort of trade-off exists between the branches. It is likely that an individual contemplating joining the military will consider

several branches of service in making their decision. For example, casualty levels in the Army may influence the number of high quality recruits who join the Air Force or Navy, where casualties are much lower.

In analyzing the trends in military recruiting it is also necessary to include some measure of the strength of the civilian work environment. If there is lower demand for labor, and unemployment is high, this may cause more high quality individuals, who may otherwise have found work elsewhere, to seek employment in the military. Similarly, when unemployment is very low high quality individuals in particular will have many more options available to them and this may hurt the military. To test this I added a variable for unemployment based on monthly unemployment statistics (seasonally adjusted) from the United States Bureau of Labor Statistics,[9] which collects the information based on the Current Population Survey. Including this variable yields the following results:

[9] http://www.bls.gov/home.htm.

Table 8: Coefficients of Service Dummys, Linear Time Trend, Interaction between Time and Service Dummy Variables, Significant Event Time Trends, Individual Service Casualties, and Monthly Unemployment Rate

Dependent variable is indicator for High Quality	**Coef.**	**Std. Err.**	**t**
Army**	-.031201	.0107149	-2.91
Navy**	-.1249792	.0102066	-12.24
Marines**	-.0641669	.0103231	-6.22
Linear time trend**	.0009674	.0002977	3.25
Time*Army**	-.0017072	.0003116	-5.48
Time*Navy	.0001573	.000243	0.65
Time* Marines**	-.0007103	.000257	-2.76
Time trend pre/post September 11th terrorist attacks	-.0097306	.0129592	-0.75
Time trend pre/post invasion of Iraq**	.0256446	.0077621	3.30
Casualties for individual service branch(lagged 1 month)	-.0003001	.0002028	-1.48
Monthly unemployment rate**	.0259821	.0059509	4.37
cons	.5783617	.0270142	21.41

(* indicates significance at the 5 percent level, ** indicates significance at the 1 percent level)

Number of Observations: 288
Prob > F = 0.0000
R-Squared: .7885

The results indicate that unemployment is significant at the one percent level, with a positive coefficient. This supports the idea that when unemployment increases the military is more able to attract high quality recruits.

Alternative Measures of High Quality Recruits

The traditional measure of high quality used by the military is based on a recruit being in the top half of the AFQT score distribution and having at least a high school diploma, or equivalent. However, evidence suggests that a high school "equivalent" degree is not equal to a high school diploma and may in fact indicate a somehwat lower

level of quality. Similar differences may exist between recruits with college degrees versus those who simply have "some college." Therefore, distinguishing between recruits with high school diplomas and/or college degrees versus those with equivalent or incomplete degrees may provide a better indicator of true quality, or at least a further differentiated measure which may help to reveal more precise trends in the level of high quality recruits in each branch of service. I call this alternative measure of quality, high quality plus. The dependent variable, $HQPLUS_{it,}$ is the percentage of recruits who are high quality (based on this new definition) in service i and month t. Estimating the same basic model as with the original definition of high quality, allowing for differing time trends across the services, I obtain the following results:

Table 9: Coefficients of Service Dummys, Linear Time Trend, and Interaction between Time and Service Dummy Variables for Alternative Measure of High Quality

Dependent variable is indicator for High Quality Plus	**Coef.**	**Std. Err.**	**t**
Army**	-.1494828	.0143937	-10.39
Navy**	-.217975	.0143937	-15.14
Marines**	-.093518	.0143937	-6.50
Linear time trend**	.0016445	.0002423	6.79
Time*Army**	-.0014878	.0003427	-4.34
Time*Navy**	.001302	.0003427	3.80
Time*Marines	-.0004553	.0003427	-1.33
cons	.6579308	.0101779	64.64

(* indicates significance at the 5 percent level, ** indicates significance at the 1 percent level)
Number of Observations: 288
Prob > F = 0.0000
R-Squared: .8065

Using the alternate measure of quality shows larger negative service effects in the Army, Navy, and Marines compared to the Air Force. The biggest difference between this more specific, higher quality measure and the traditional measure is seen in the coefficient for the Army. Figure 10 shows the differences between services in terms of this alternative measure of high quality across the sample period. The percentage of high quality plus recruits has declined much more than overall percentage of high quality recruits using the traditional definition. This trend is most notable in the Army which suggests that more recruits of arguably lower quality have been accepted even though the traditional measure does not capture this difference. Figures 11-14 show the difference in percentages of high quality versus high quality plus recruits for each service over the sample period. The difference between the two measures is smallest in the Air Force which again suggests the Air Force has been most successful in attracting high quality recruits. The difference between the two measures is largest in the Army, which also shows the most decline. This provides evidence that the Army has been forced to accept a greater number of lower quality recruits, especially in the most recent months, even if this trend is not as evident when looking at the traditional measure of high quality used by the military.

Adding the additional time trends for the September 11th attacks and the invasion of Iraq as well as the casualty measure based on each service branch separately, to the model produces the following results:

Table 10: Coefficients of Service Dummys, Linear Time Trend, Interaction between Time and Service Dummy Variables, Significant Event Time Trends, and Individual Service Casualties for Alternative Measure of High Quality

Dependent variable is indicator for High Quality Plus	**Coef.**	**Std. Err.**	**t**
Army**	-.1593213	.014847	-10.73
Navy**	-.2179216	.0141542	-15.40
Marines**	-.0981842	.0143129	-6.86
Linear time trend	.0007166	.000397	1.80
Time*Army*	-.0008995	.0004306	-2.09
Time*Navy**	.001307	.000337	3.88
Time* Marines	-.0002031	.000356	-0.57
Time trend pre/post September 11th terrorist attacks*	.0222202	.0097103	2.29
Time trend pre/post invasion of Iraq*	.025999	.0106788	2.43
Casualties for individual service branch(lagged 1 month)*	-.0006118	.0002787	-2.19
cons	.6664756	.0105919	62.92

(* indicates significance at the 5 percent level, ** indicates significance at the 1 percent level)

Number of Observations: 288
Prob > F = 0.0000
R-Squared: .8149

The results indicate are similar to the less specified model, but here casualties are also significant at the five percent level. Using instead, the alternate casualty variable (total casualties for all services) produces the following results:

Table 11: Coefficients of Service Dummys, Linear Time Trend, Interaction between Time and Service Dummy Variables, Significant Event Time Trends, and Total Casualties for Alternative Measure of High Quality

Dependent variable is indicator for High Quality Plus	**Coef.**	**Std. Err.**	**t**
Army**	-.1494828	.0141747	-10.55
Navy**	-.217975	.0141747	-15.38
Marines**	-.093518	.0141747	-6.60
Linear time trend*	.0010397	.0004141	2.51
Time*Army**	-.0014878	.0003375	-4.41
Time*Navy**	.001302	.0003375	3.86
Time* Marines	-.0004553	.0003375	-1.35
Time trend pre/post September 11th terrorist attacks*	.0201522	.0099192	2.03
Time trend pre/post invasion of Iraq*	.0316968	.0119754	2.65
Total Casualties for all service branches (lagged 1 month)*	-.0002832	.0001416	-2.00
cons	.6615593	.0106593	62.06

(* indicates significance at the 5 percent level, ** indicates significance at the 1 percent level)

Number of Observations: 288
Prob > F = 0.0000
R-Squared: .8149

Unlike in the model using the traditional measure of high quality, in this model both ways of measuring casualties prove to be significant. The variable for total casualties in this model indicates a negative effect, significant at the five percent level. This provides some support for the argument that the higher quality an individual is the more likely casualties will influence his/her decision to enlist, especially in the Army given its high casualty rate.

Finally, adding monthly unemployment statistics to this model yields the following results:

Table 12: Coefficients of Service Dummys, Linear Time Trend, Interaction between Time and Service Dummy Variables, Significant Event Time Trends, Total Casualties, and Monthly Unemployment Rate for Alternative Measure of High Quality

Dependent variable is indicator for High Quality Plus	**Coef.**	**Std. Err.**	**t**
Army**	-.1556063	.013815	-11.26
Navy**	-.2179417	.0131597	-16.56
Marines**	-.0964223	.0133099	-7.24
Linear time trend**	.0014177	.0003838	3.69
Time*Army**	-.0011216	.0004017	-2.79
Time*Navy	.0013051	.0003133	4.17
Time* Marines**	-.0002984	.0003313	-0.90
Time trend pre/post September 11th terrorist attacks	-.0715173	.0167087	-4.28
Time trend pre/post invasion of Iraq**	.0176052	.0100079	1.76
Casualties for individual service branch(lagged 1 month)	-.0003808	.0002615	-1.46
Monthly unemployment rate**	.0511551	.0076727	6.67
cons	.4437328	.0348302	12.74

(* indicates significance at the 5 percent level, ** indicates significance at the 1 percent level)

Number of Observations: 288
Prob > F = 0.0000
R-Squared: .8406

Unemployment is again significant at the one percent level. In this model the coefficient on unemployment is larger, which indicates that higher quality individuals are more sensitive to conditions in the civilian workplace in determining their choice of

employment. This is reasonable given the fact that a priori one would expect higher quality individuals to have more choices available to them.

IV. Conclusion

An analysis of the data on new recruits entering the military between fiscal year 1999 and fiscal year 2005 clearly shows changes in recruit quality. If factors such as increased combat operations and casualties resulting from the War on Terrorism are important for military recruiting it would be expected that the military's ability to recruit would decrease over the sample period. If this is not the case it is likely that either the services began accepting lower quality recruits to fill the ranks, increased incentives to continue to attract the same quality of recruits, increased the aggressiveness in recruiting by recruiting more individuals overall, even if a declining portion of individuals who were targeted actually chose to enlist. Empirical Analysis suggests that the military has faced increased difficulties in meeting recruiting objectives and that these difficulties have been compensated for at least in part by accepting more recruits of lower quality. Based on the data used in this paper it is difficult to come to a clear conclusion on the effects of recruiting incentives as a whole. The data reveals that enlistment bonuses over this time period have declined which may be one reason for attracting lower quality recruits. However, it does not appear that declining enlistment bonuses have been compensated for by increasing educational benefits based on the available data for Montgomery G.I. Bill benefits. Additionally, the presence of other incentives which vary across service, such as the Army College Fund or more recently a referral bonus, may

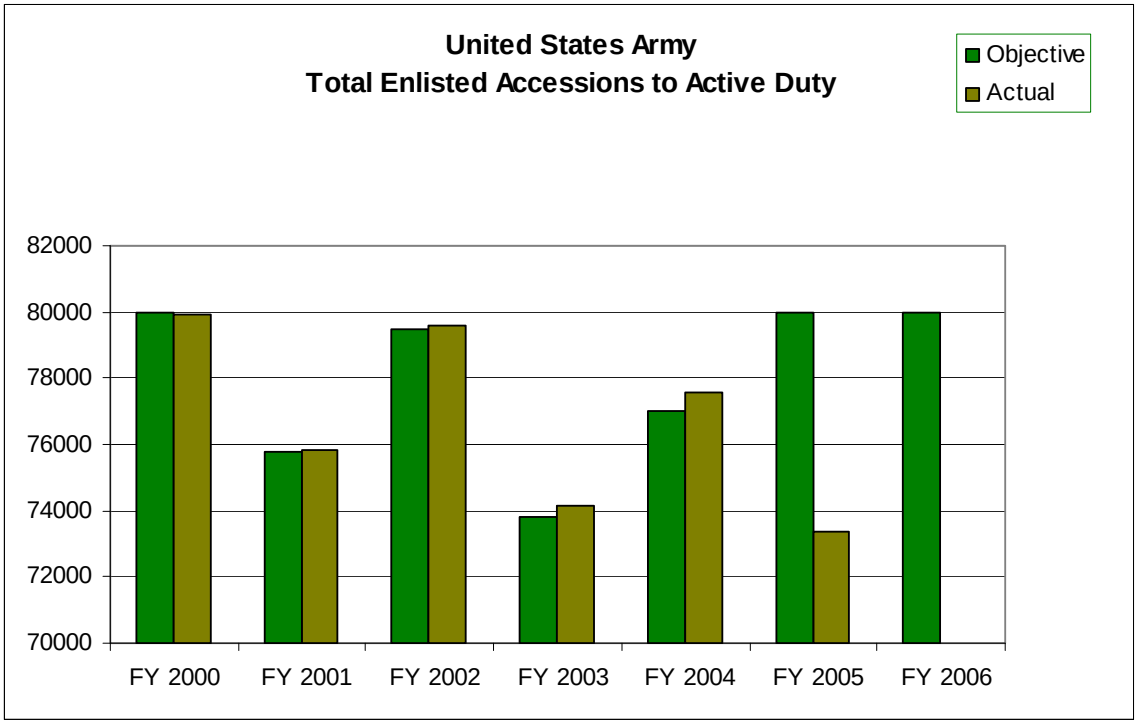
have significant impacts which are not revealed in this data set. With the passage of the 2006 Defense Authorization Act Congress has approved even greater enlistment incentives. Incentive changes include an increase in the maximum bonus for recruits entering specific specialties, a doubling in the maximum non prior service initial enlistment bonus, and a one year test of a referral bonus for active duty members who refer non-family members to enlist (Army only).[10] However, a general screening of these benefits would lead to the conclusion that if anything the ability to attract quality recruits would be enhanced by their inclusion, and the data reveals that this is not the case. Furthermore, including further enlistment incentives would do little to help explain the disparities between the services, especially since incentives seem to be increasing the most for Army recruits, even as the Army shows the lowest percentages of high quality recruits. The aggressiveness of recruiters and overall money spent on recruiting are also not included in any of the models used in this paper. However, if anything, it would be expected that aggressiveness in recruiting has increased, which a priori would likely favor the military's ability to recruit higher quality individuals, yet the data shows that this has not been the case.

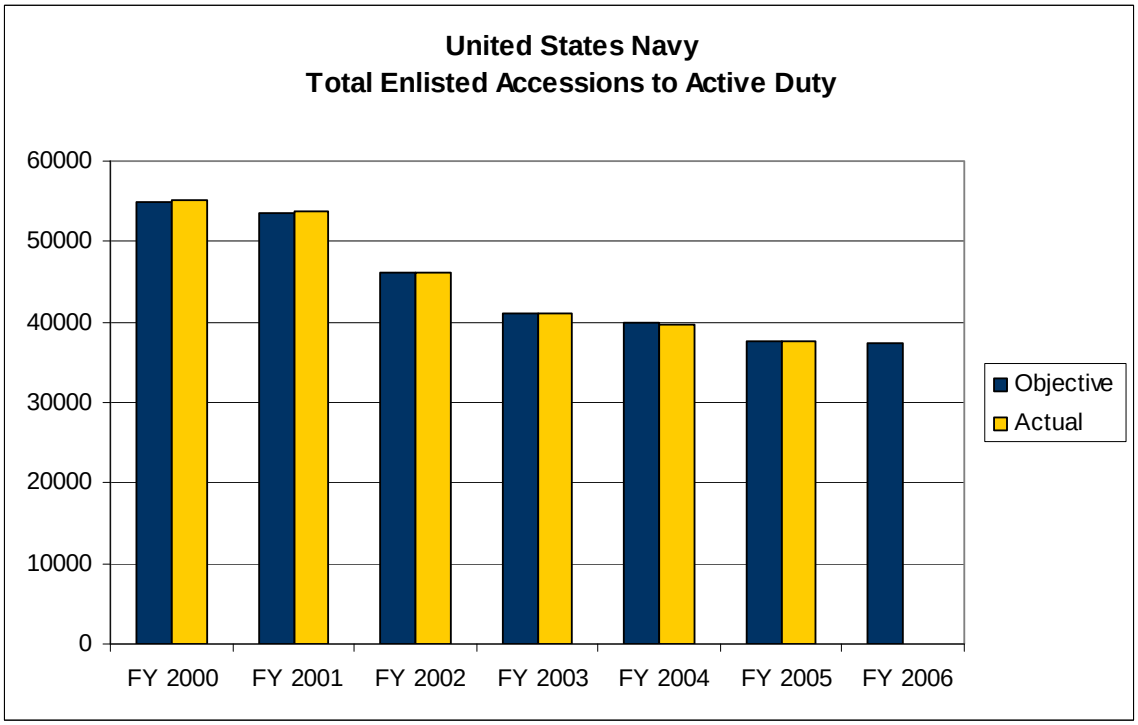
It is ultimately clear that the War on Terrorism has affected military recruiting. Initial results indicate that the ability of all the service branches to attract high quality recruits has been hurt in recent months, especially in the Army, and this trend is likely to continue as the War on Terrorism progresses. However, clearly understanding these

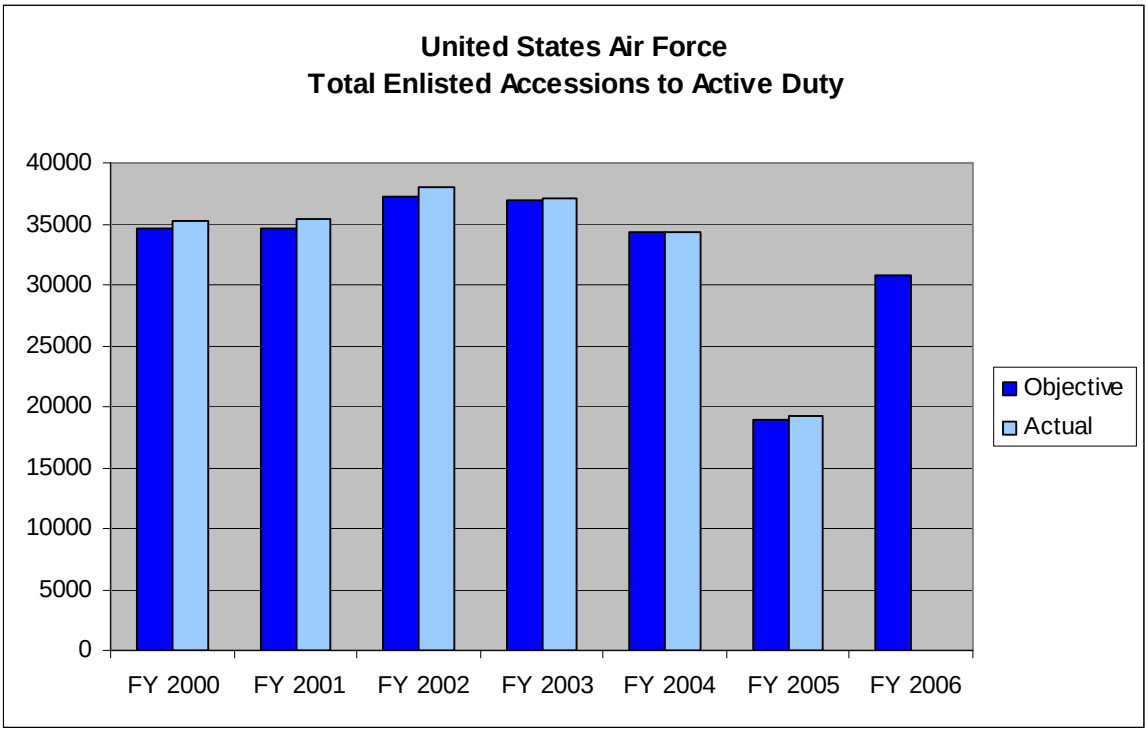
[10] Active Duty initial enlistment bonus maximum increased from $20,000 to $40,000. Referral bonus of $1000 paid after referred member completes basic training.

effects and sorting out their specific causes will require more available data and continued research in this area.

Figure 1: Objective Recruitment Goals vs. Actual Recruits






United States Air Force
Total Enlisted Accessions to Active Duty
40000
35000
30000
25000
20000
15000
10000
5000
0
FY 2000
FY 2001
FY 2002
FY 2003
FY 2004
FY 2005
FY 2006
Objective
Actual

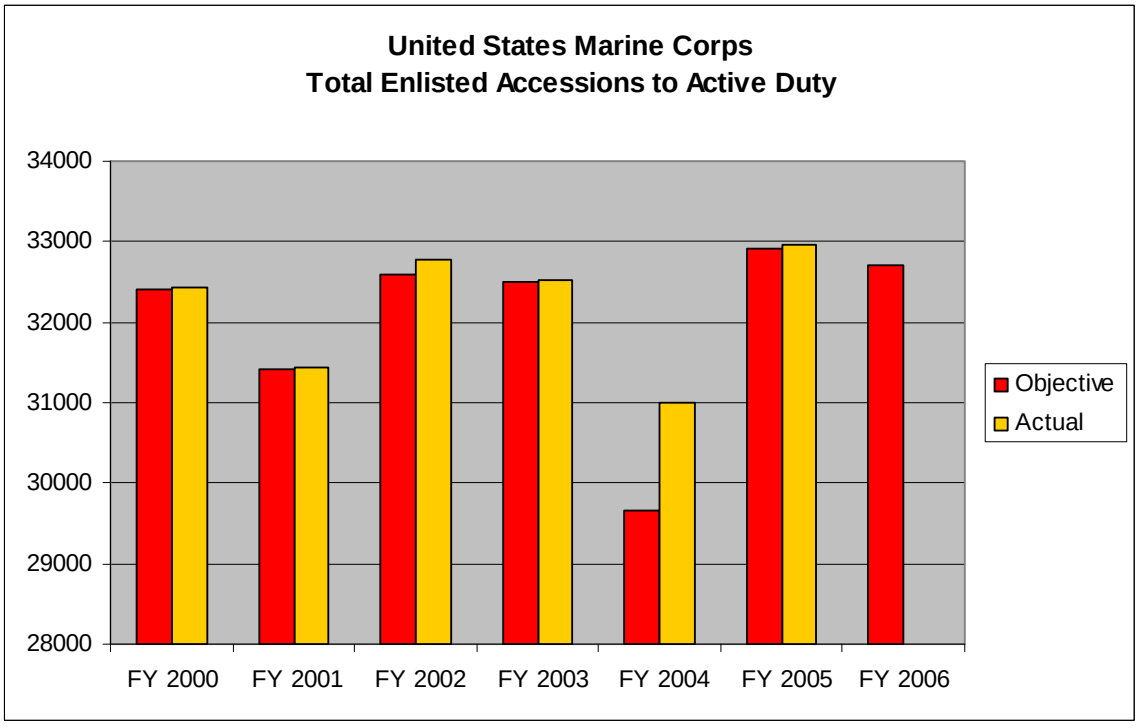

United States Marine Corps
Total Enlisted Accessions to Active Duty
34000
33000
32000
31000
30000
29000
28000
FY 2000
FY 2001
FY 2002
FY 2003
FY 2004
FY 2005
FY 2006
Objective
Actual

Table 1: AFQT Scores by Category

Category	AFQT Percentile
1	>92%
2	65-92%
3A	50-64%
3B	31-49%
4A	21-30%
4B	16-20%
4C	10-15%
5	01-09%
0	Unknown

Figure 2: Total Number of Monthly Recruits by Service Branch

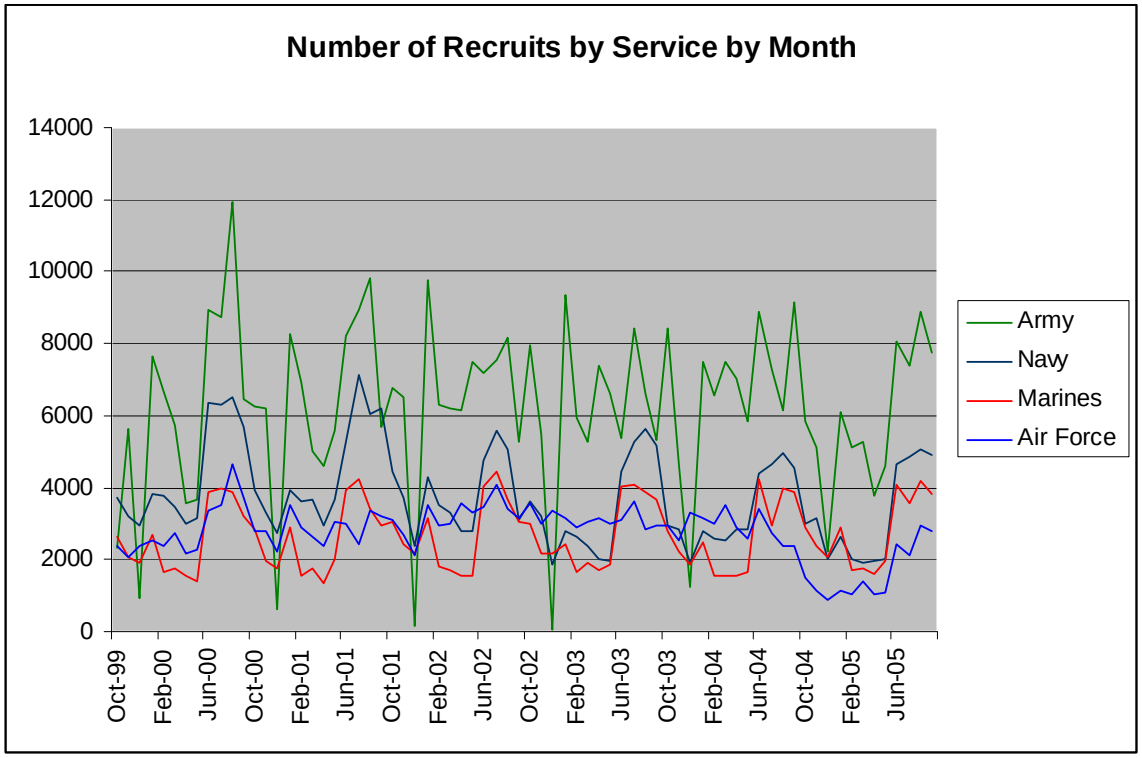


Figure 3: Percentage of Recruits Receiving Initial Enlistment Bonuses

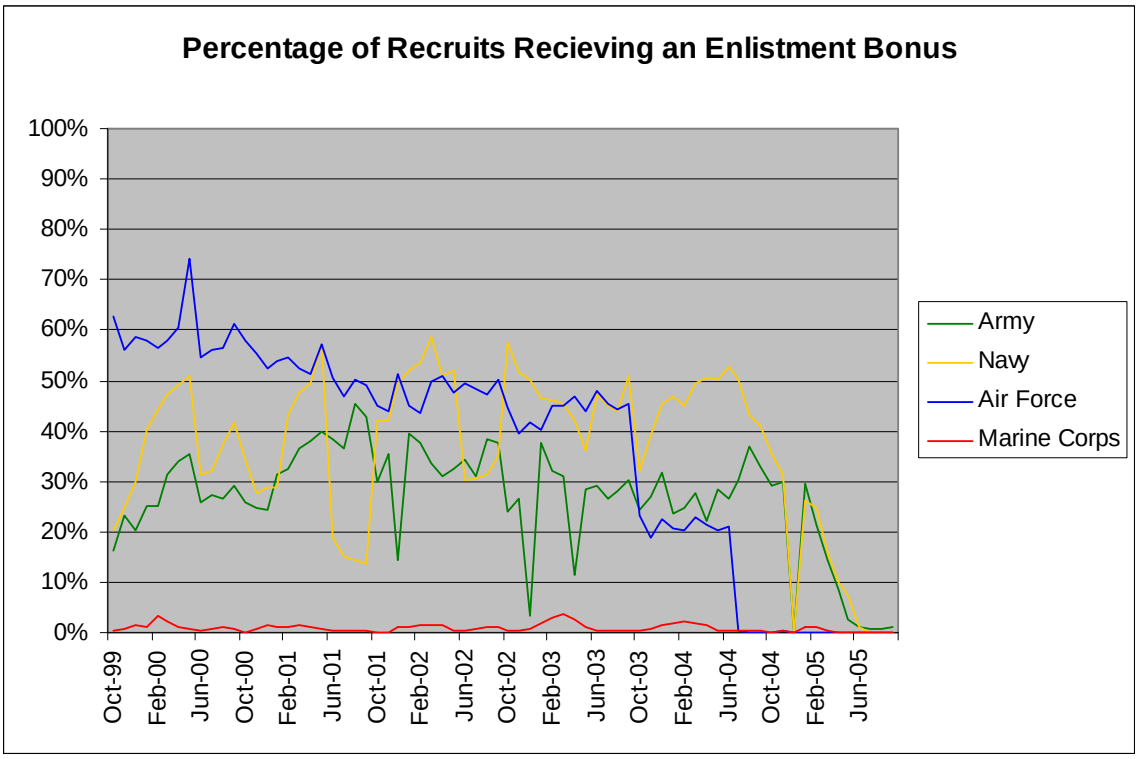


Figure 4: Declining Expenditures on Enlistment Bonuses

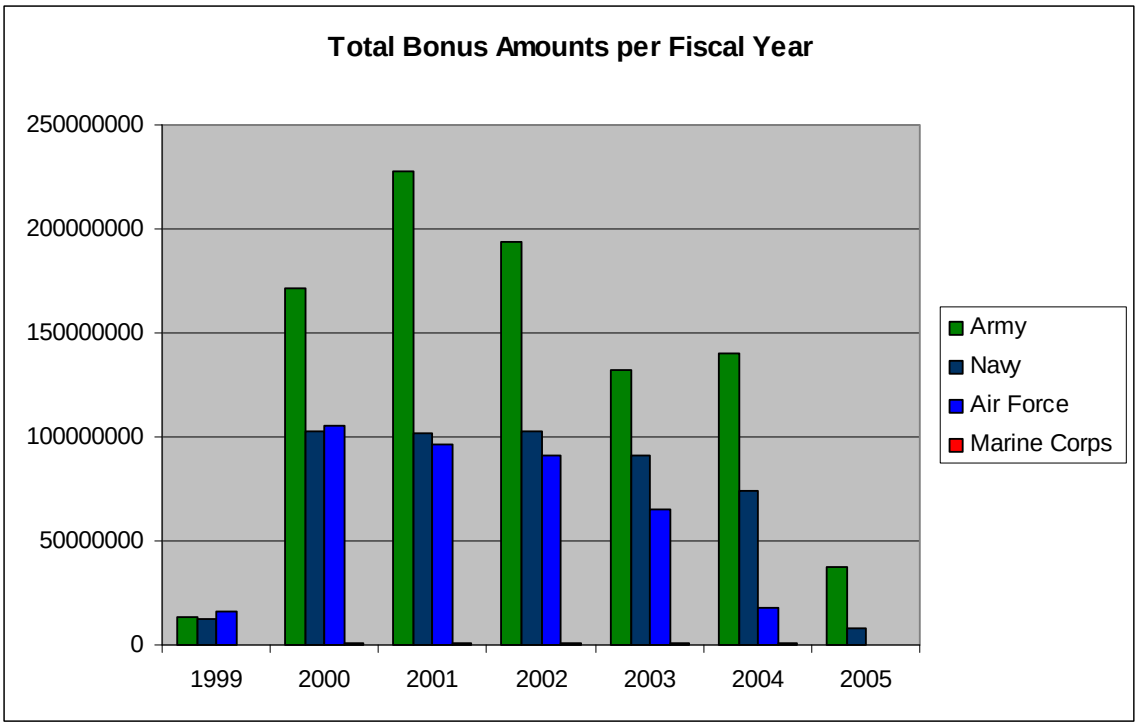


Figure 5: Percentage of Recruits Receiving MGIB Benefits at Initial Entry

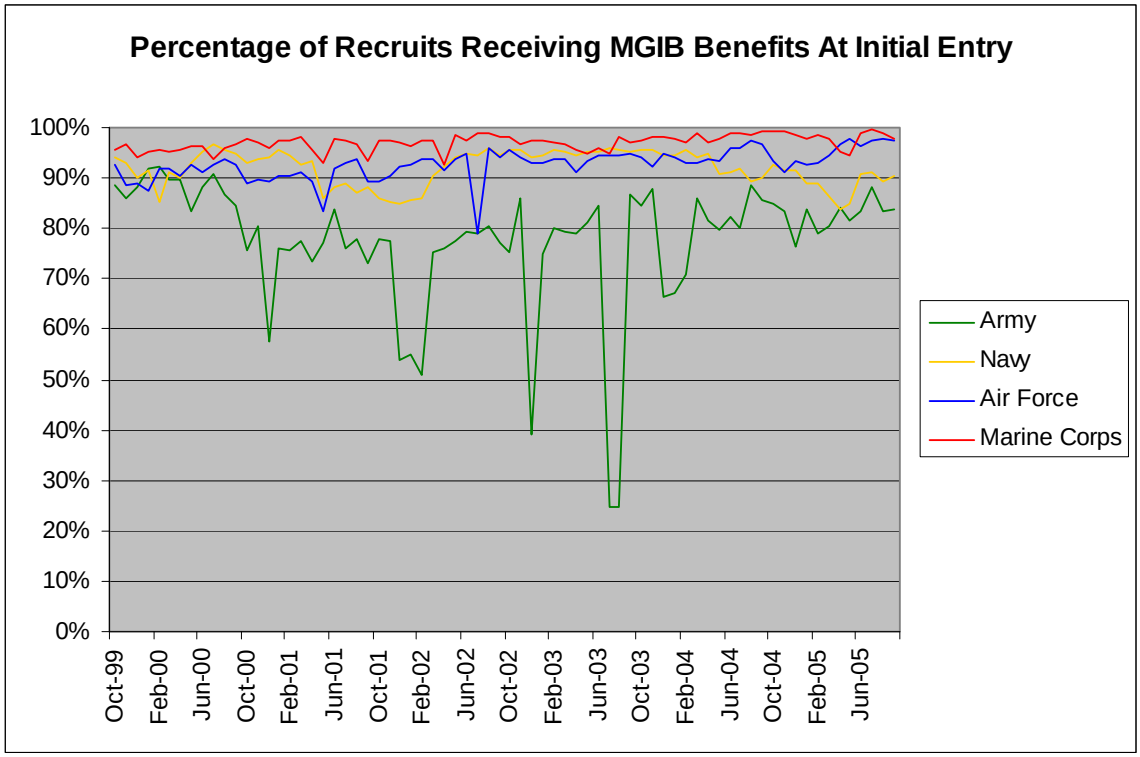


Table 2: AFQT and Education Percentage Matrix

Army: (High Quality: 65.1%)

	< High School	**High School or Equivalent**	**Some College**	**College +**
1	0.148012%	3.390041%	0.398698%	1.361439%
2	0.959852%	28.63023%	1.769471%	2.166835%
3A	0.835176%	25.88379%	1.095419%	0.4471465%
3B	0.410699%	26.72341%	1.209427%	0.234018%
4A-5	0.003334%	1.747914%	0.071561%	0.017335%
0	0.006667%	0.872735%	0.000222%	0.034669%

Navy: (High Quality: 62.2%)

	< High School	**High School or Equivalent**	**Some College**	**College +**
1	0.061756%	4.370519%	0.207961%	0.420385%
2	1.170755%	30.72645%	1.163686%	0.797244%
3A	1.828118%	23.41658%	0.863464%	0.254835%
3B	0.481769%	30.68739%	1.574399%	0.185639%
4A-5	0.000372%	0.065848%	0.001116%	0%
0	0.009673%	1.086305%	0%	0.027902%

Air Force: (High Quality: 74.7%)

	< High School	**High School or Equivalent**	**Some College**	**College +**
1	0.026157%	4.766145%	0.416503%	0.3717345%
2	0.1559375%	38.70964%	1.539754%	0.696184%
3A	0.064387%	27.41929%	0.57898%	0.182094%
3B	0.05483%	20.62395%	0.279681%	0.07495%
4A-5	0%	0.065896%	0.001006%	0%
0	0.014085%	1.472349%	0%	1.79529%

Marine Corps: (High Quality: 65.9%)

	< High School	**High School or Equivalent**	**Some College**	**College +**
1	0.01316%	3.728425%	0.136335%	0.186869%
2	0.177394%	33.8427%	0.642197%	0.319519%
3A	0.167919%	26.67379%	0.316887%	0.058956%
3B	0.110542%	31.16969%	0.264248%	0.055797%
4A-5	0.000526%	0.739052%	0.004738%	0.001053%
0	0.001053%	0.42006%	0%	0.006317%

Figure 6: AFQT Scores by Percentile

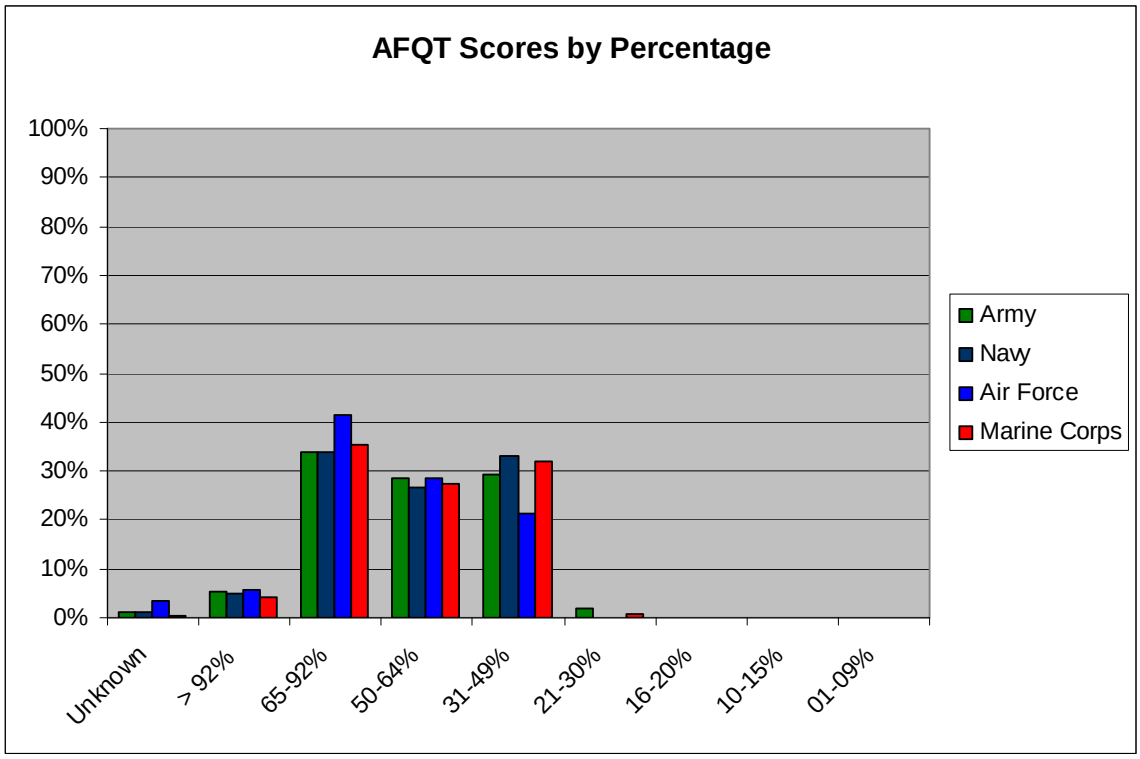


Figure 7: Low AFQT Scores by Branch of Service

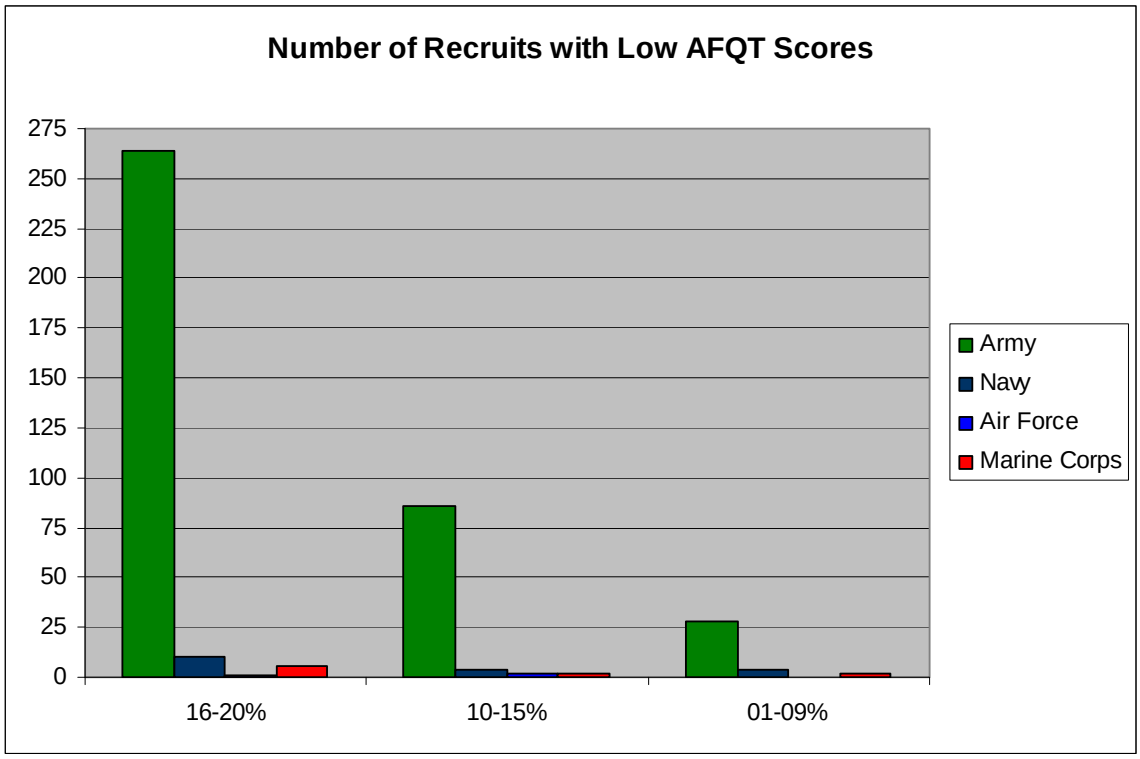


Figure 8: Percentage of High Quality Recruits by Month

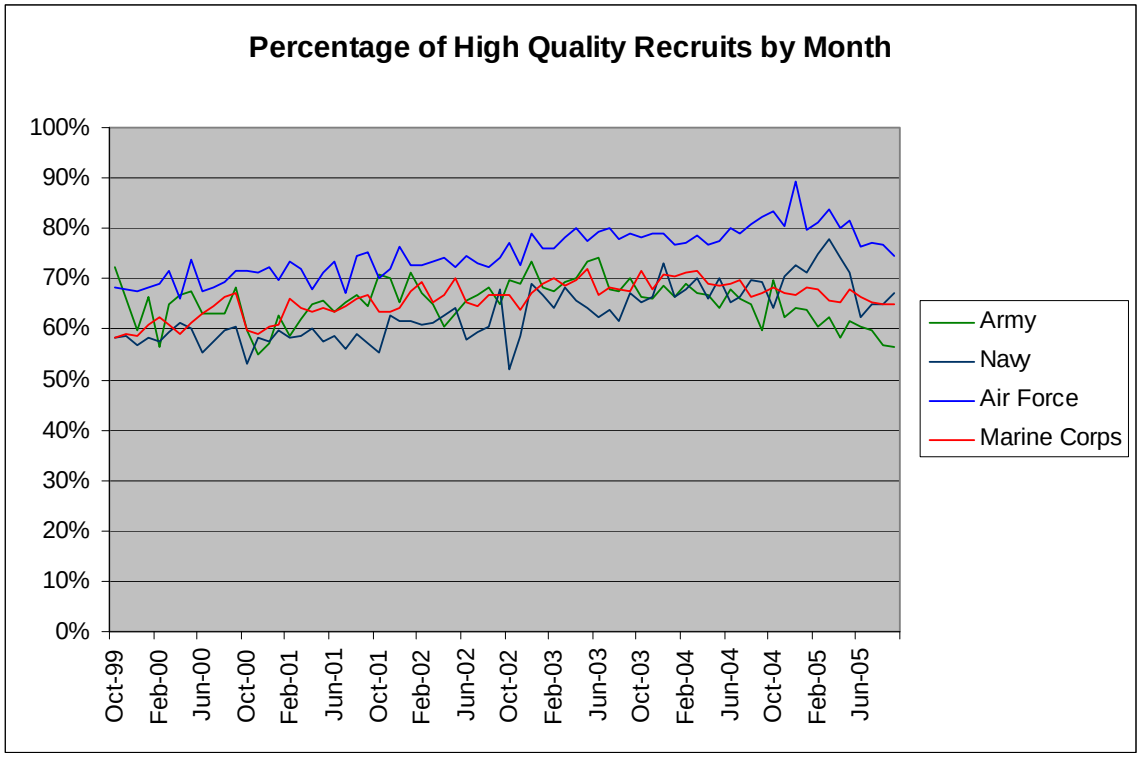
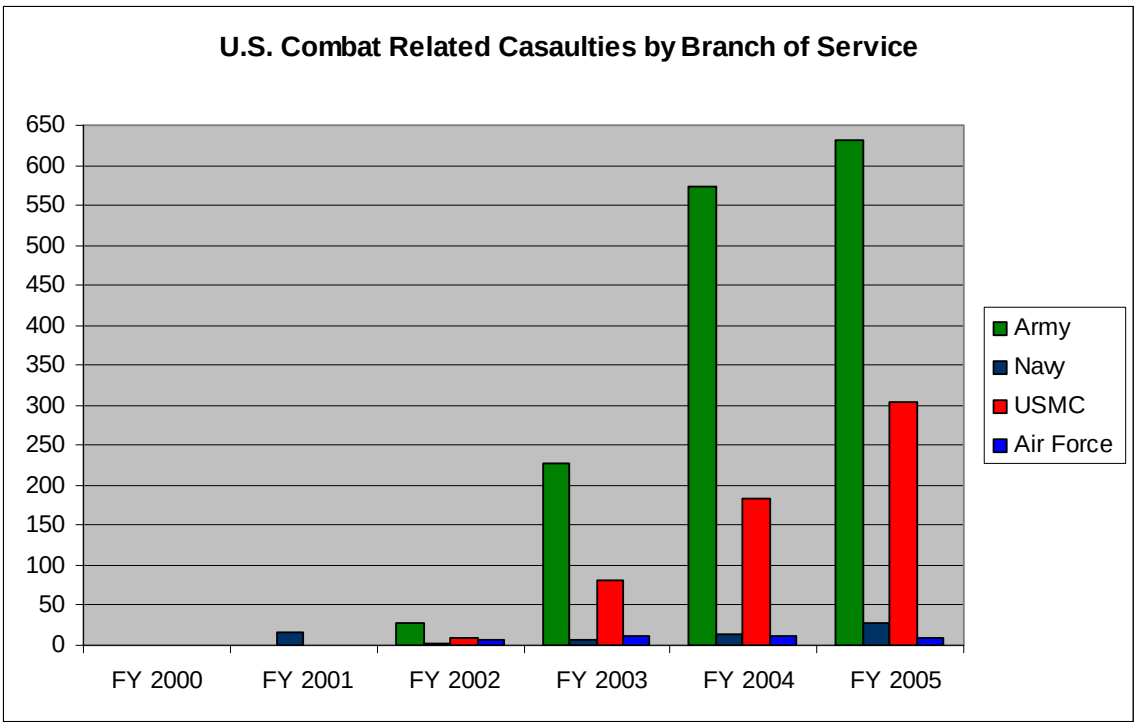


Figure 9: Combat Casualties[11]



[11] Included combat related casualties-casualties related to carrying out the War on Terrorism, including friendly-fire or training accidents in the theater of combat. Does not include 9/11 casualties.

Figure 10: Percentage of High Quality vs. High Quality Plus Recruits by Month

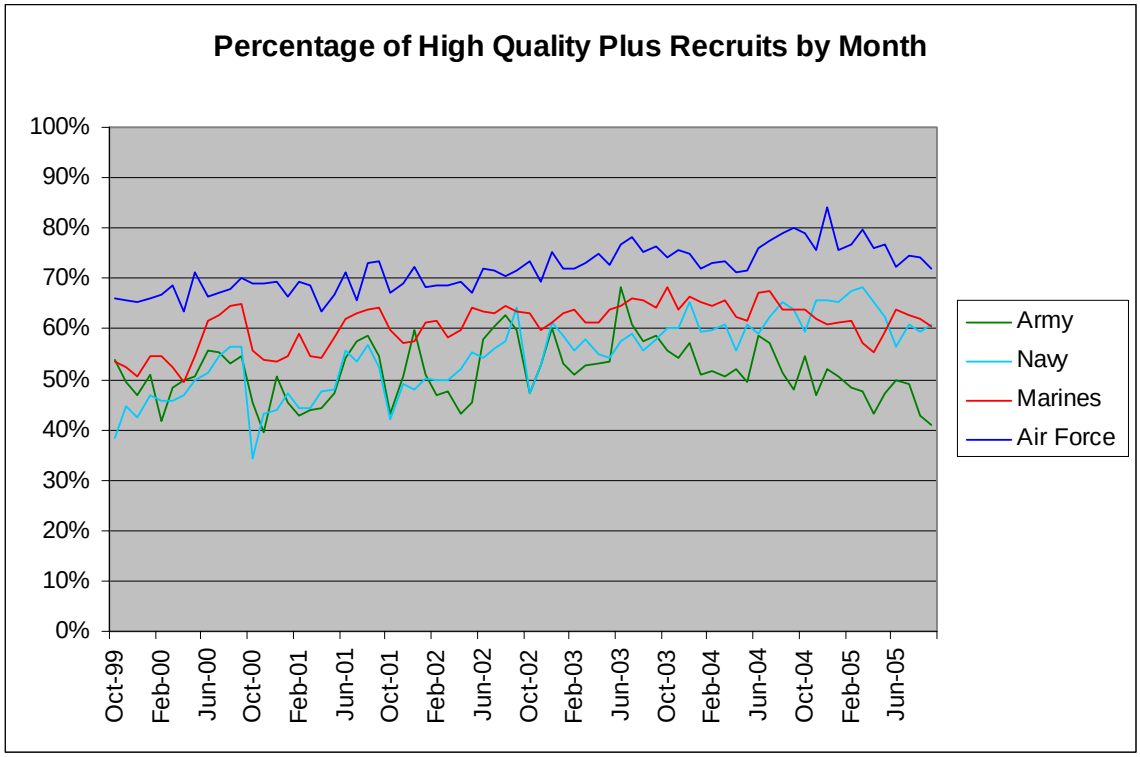


Figure 11: Percentage of High Quality vs. High Quality Plus Army Recruits by Month

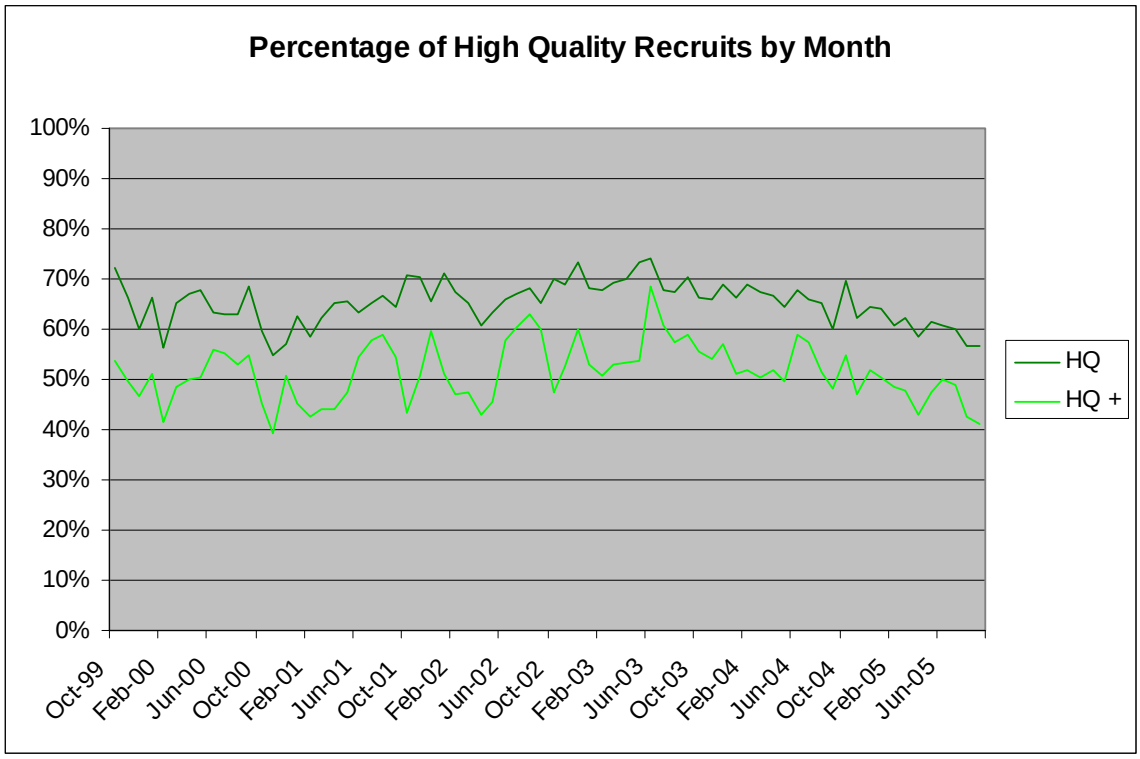


Figure 12: Percentage of High Quality vs. High Quality Plus Navy Recruits by Month

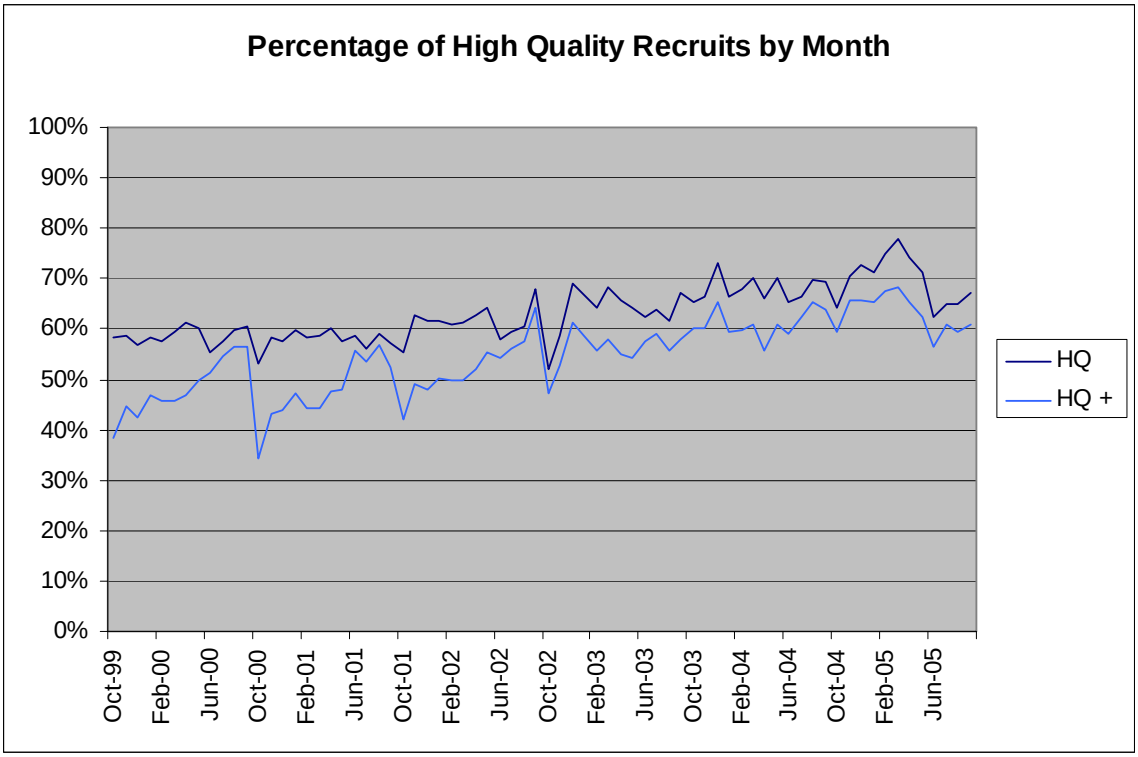


Figure 13: Percentage of High Quality vs. High Quality Plus Air Force Recruits by Month

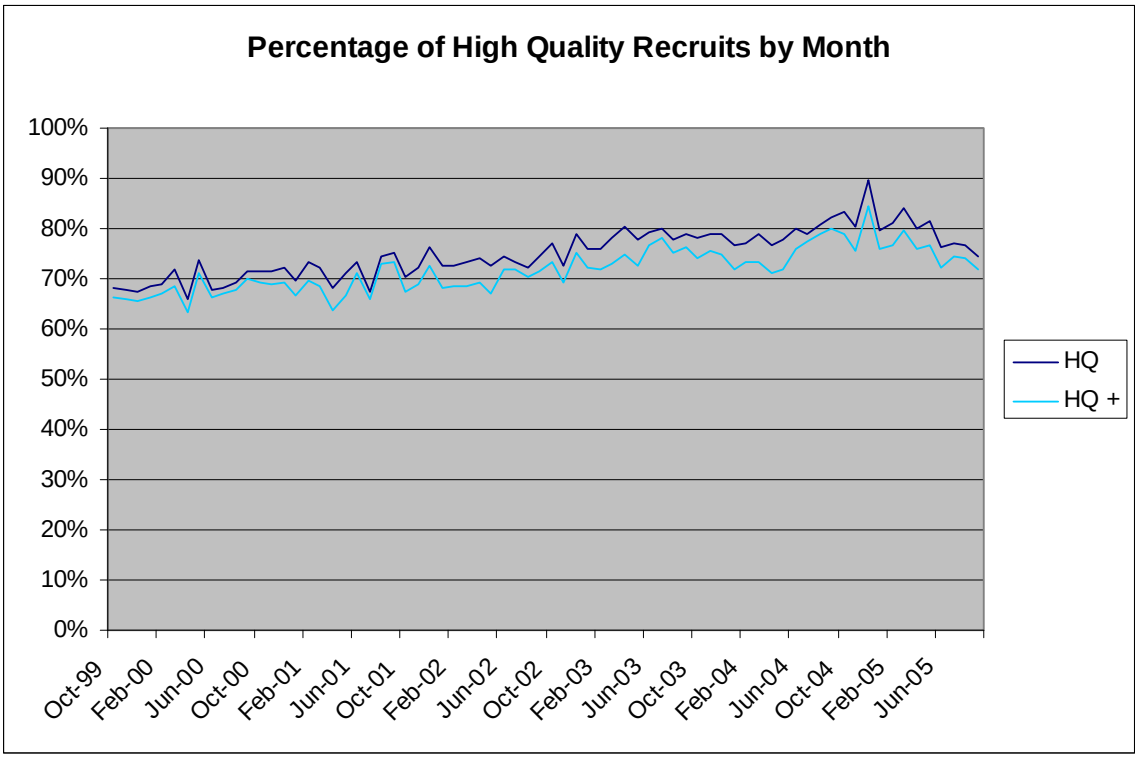
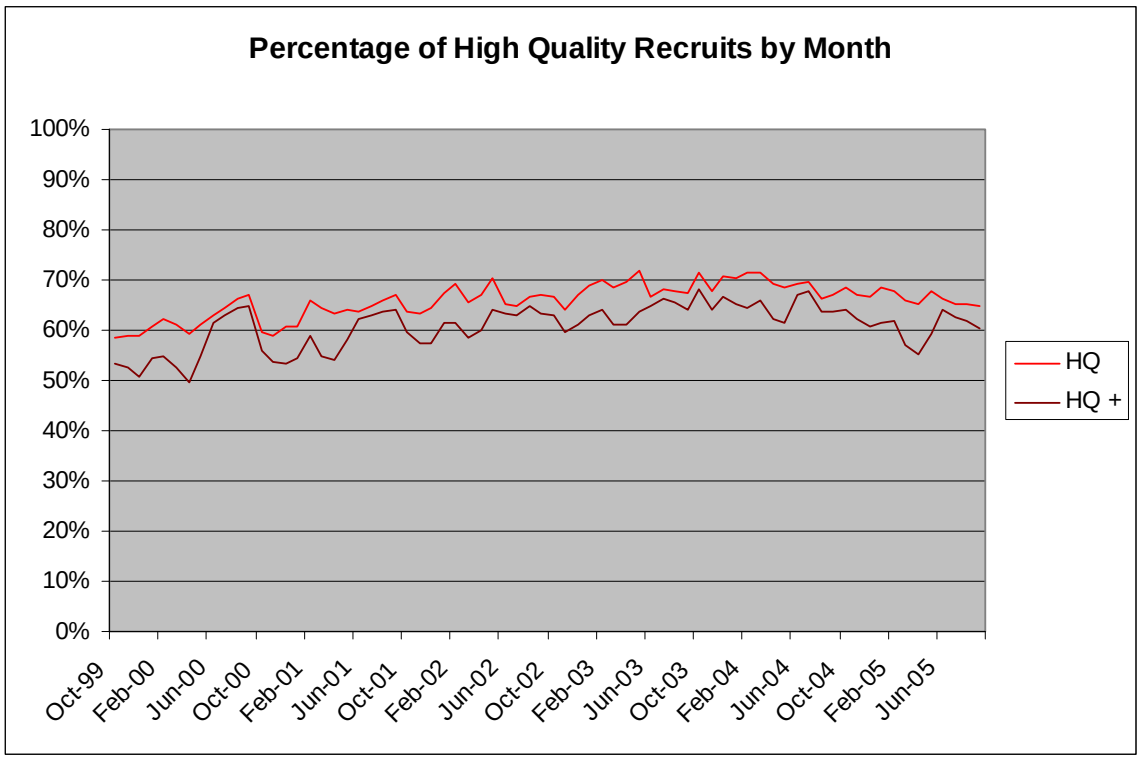


Figure 14: Percentage of High Quality vs. High Quality Plus Marine Corps Recruits by Month



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Vita

Maggie Catherine Austin was born in San Rafael, CA. After completing her work at James M. Bennett High School in Salisbury, MD, in 1999, she first attended the University of Colorado at Boulder in Boulder, Colorado from 1999-2001 and then the United States Air Force Academy in Colorado Springs, Colorado from 2001-2005. She graduated from the Academy in June 2005, receiving the degrees of Bachelor of Science in Economics and Political Science and a commission as a Second Lieutenant in the United States Air Force. In August 2006, while serving in the Air Force, she entered The Graduate School at the University of Texas.

This thesis was typed by the author.